#713

PHILIPS

MANUAL

PASSIVE PROBE PM 9350

ATTENUATION 10x

Versions /02 and higher

9499 440 10311

720301/1/02

1.2 TECHNICAL DATA

Electrical

	Characteristic		Specified performance	Additional information
1.2.1.	Compensation range		≥ 14 pF up to ≤ 21 pF	Input capacitance of oscilloscope, that can be compensated for
1.2.2.	Attenuation		10x (±2 %)	Probe connected to 1 MΩ (±1 %) oscilloscope input
1.2.3.	Input resistance	DC	10 MΩ (±2 %)	Probe connected to 1 MΩ (±5 %) oscilloscope input
		AC	See curve Fig. 1.2.1.	
1.2.4.	Input capacitance reactance at	LF	11 pF (±1 pF)	Probe connected to 1 MΩ, paralleled by 14 pF to 21 pF oscilloscope input
		HF	See curve Fig. 1.2.1.	
1.2.5.	Rise time		≤ 2 ns	Probe only; measured between 10 % and 90 % points of step response
1.2.6.	Bandwidth		DC - ≥ 175 MHz	Probe only; measured at 70 % (-3 dB)
1.2.7.	Aberrations (ringing, rounding, overshoot and tilt)		not exceeding ±2 %	Probe only; measured with 1 ns rise time pulse on a 7 ns rise time oscilloscope
1.2.8.	Maximum allowable voltage $DC + AC_{peak}$ for derating of AC component at high frequencies		±500 V See Fig. 1.2.2.	Probe connected to a 1 MΩ oscilloscope input. Maximum voltage applicable between probe tip and earthed part of probe body
1.2.9.	Test voltage		1500 V DC during 1 sec.	Test conditions: probe output terminated with 1 MΩ. Temperature: 15 °C to 25 °C; rel. humidity: ≤ 80 %; at sea level

Environmental

	Characteristic	Specified performance	Additional information
1.2.10.	Temperature		
	Storage	-40 °C to +70 °C	Test procedure IEC 68 tests Ab and Bb; recovery time from -40 °C to room temperature being 1 hour
	Operating	-25 °C to +70 °C	Test procedure IEC 68 tests Ab and Bb. Within electrical specifications
1.2.11.	Humidity, non-operating	21 cycles of damp heat test; temperature 25 to 40 °C; relative humidity 90 to 100 %; cycle time 24 hours	Test procedure IEC 50 B (CO) 142
1.2.12.	Altitude		
	Operating	to 5,000 m	Within electrical specifications
	Storage	to 15,000 m	

Environmental

Characteristic	Specified performance	Additional information
1.2.13. Vibration, operating	45 minutes each axis; frequency varied 10 Hz - 150 Hz - 10 Hz in ten-minute cycles; constant displacement 0.7 mm p-p from 10 Hz to 60 Hz; constant acceleration 5 g from 60 Hz to 150 Hz. Further 10 minutes each axis at any resonance point. Attachment to vibration platform by means of a BNC connector at one end and a mini connector at the other end	Test procedure IEC 68 test F
1.2.14. Shock, non-operating	Probe stands 1,000 bumps each axis of half sine waves with a peak acceleration of 10 g. Attachment to shock platform by means of BNC connector at one end and a mini connector at the other end	Test procedure IEC 50 A (CO) 110
1.2.15. Transport		
Package drop	1 m on each corner and each flat surface, 12 drops in total	
Package toppling	10 minutes each axis at a frequency of 7 Hz and an amplitude of 7 mm.	

Mechanical

Characteristic	Specified quantity				Additional information
1.2.16. Dimensions	L	W	H		
Probe body	105	20 (max)	-	mm	
Cable	1500	-	-	mm	
Correction box	80	33	17	mm	+BNC connector
1.2.17. Weight net	250 gr.				Probe in carrying case, including standard accessories

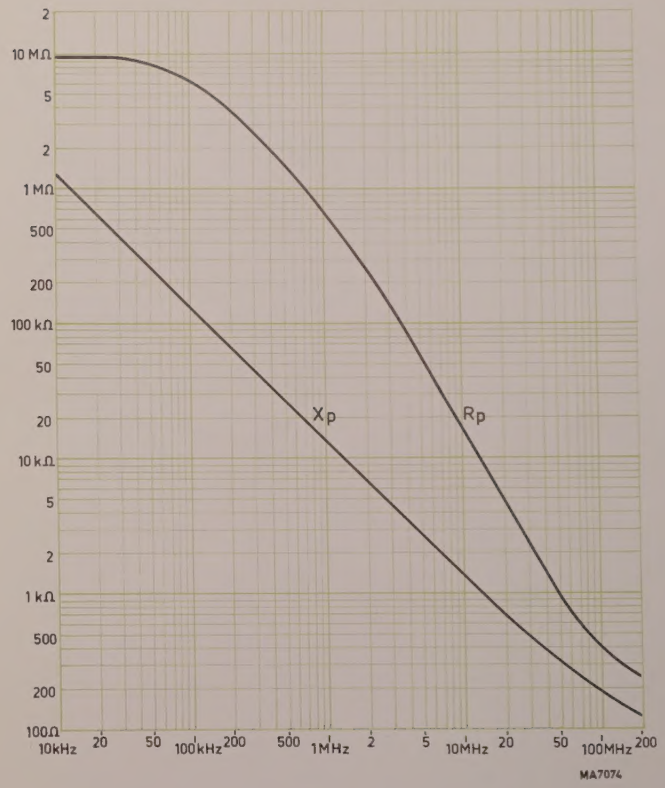

Fig. 1.2.1. Input resistance (R_p) and reactance (X_p) versus of frequency

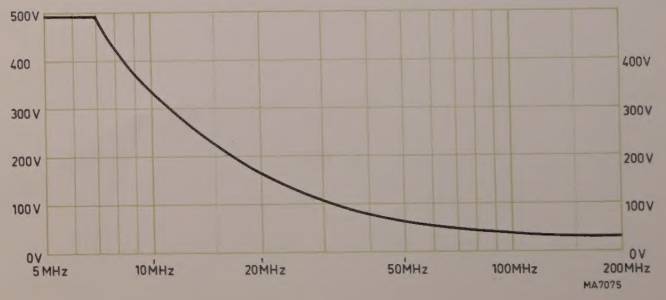

Fig. 1.2.2. Max AC component of input voltage ($\pm V_{peak}$) as a function of frequency

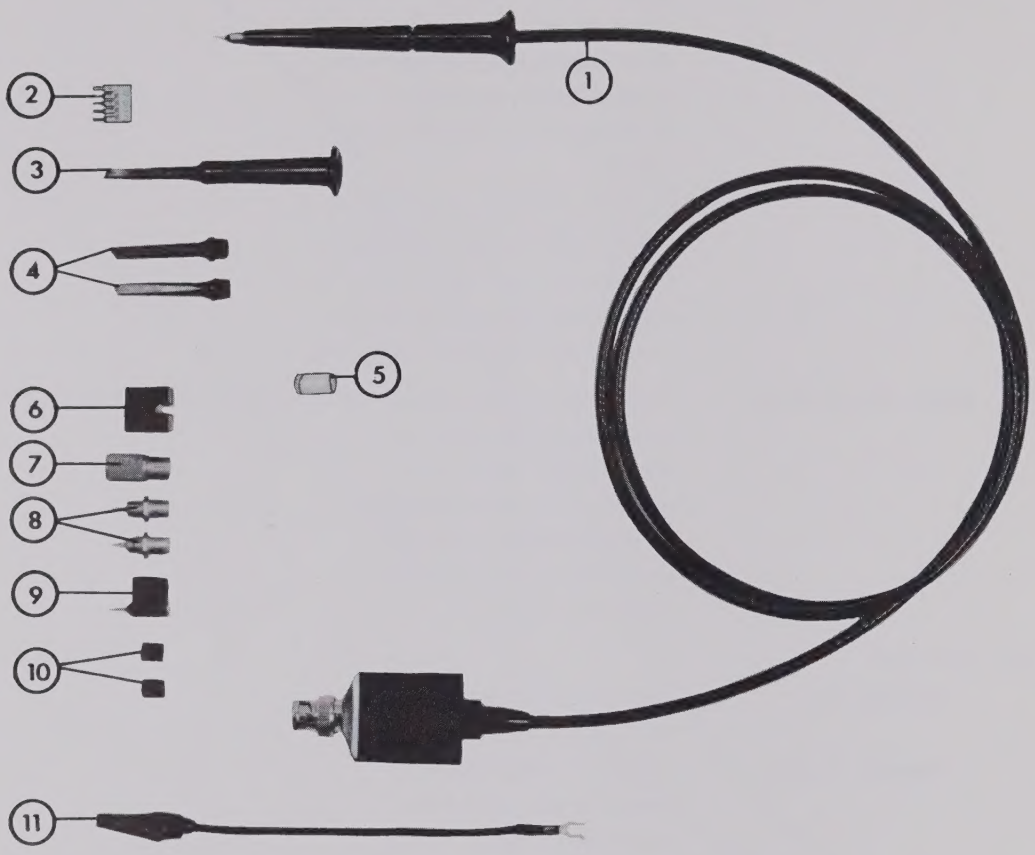

Fig. 1.3.1. Probe with accessories

1.3 ACCESSORIES

Item 1 Prob tip, cable and compensation box.

Item 2 Five soldering terminals.
In densely wired circuits the soldering terminals may be incorporated as routine-test points.

Item 3 Test hook.
The test hook is slid over the probe tip; by pushing the probe tip deeper in the test hook, the hook will protrude, so that the test point can be gripped.

Item 4 Two spare test hook sleeves.
These test hook sleeves are supplied with the probe, to serve as replacements for damaged parts. The test hook sleeve is screwed on to the test hook holder.
Insert the wire hook so that the opening is formed by its tip and the longer side of the sleeve.

Item 5 Two protective caps.
If the probe is not in use, one of the protective caps should be fitted in order to prevent damage to the probe pin.

Item 6 Probe holder.
Being clipped to the measuring cable near the compensation box, the holder can receive the probe end of the cable to prevent the probe from dangling around.

Item 7 BNC/measuring pin adaptor plug.

Item 8 Two miniconnectors.
These miniconnectors may be incorporated into a circuit as routine-test points.
Earthing the outer shell of the miniconnectors obviates use of the earthing cord (item 11 in fig. 1.3.1.).

Item 9 Earthing attachment.
This attachment facilitates signal and earth connections, if the test point is surrounded by an earthed surface.
The spring loaded earthing pin guarantees a good connection even when the test point and earthing point are on different levels.

Item 10 Two insulating caps.
In densely wired circuits, an insulating cap may be slid over the metal part of the probe, to prevent contact between the probe housing and surrounding conductors.
The earth connection is made by means of the earthing cord (item 11 in fig. 1.3.1.).

Item 11 Earthing cord.
The fork of the earthing cord is pushed into the slod in the middle of the probe body.
The crocodile clip is connected to the earthing point of the circuit under test.

II. OPERATION

The measuring probe has been adjusted and checked by the factory. However, to match the probe to your oscilloscope, the following manipulation is necessary.
Connect the measuring pin to socket CAL of the oscilloscope.
A trimmer (C3) can be adjusted through a hole in the compensation box to obtain optimum square-wave response.

See the following examples Fig. 2.1.1, 2.1.2, 2.1.3.

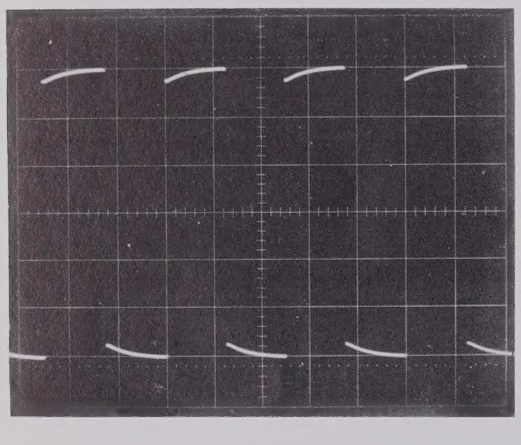

Fig. 2.1.1. C3 overadjusted

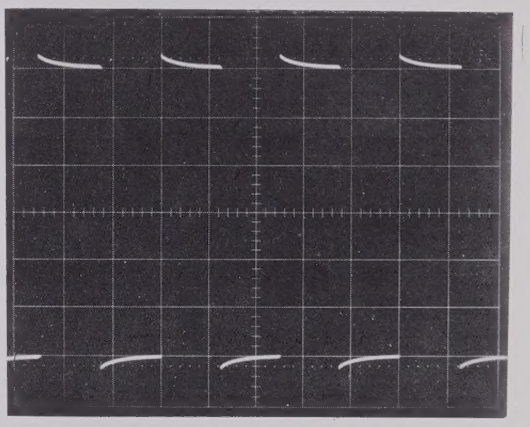

Fig. 2.1.3. C3 underadjusted

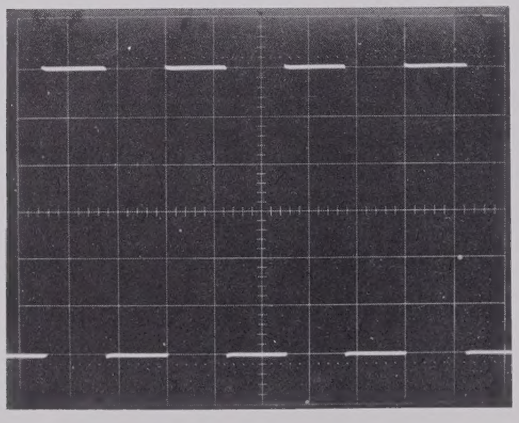

Fig. 2.1.2. C3 correctly adjusted

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720531 PM 9350/02 Cd 746

ERRATUM

On using the PM 9350/02 manual, please consult the subjoined diagrams instead of the original ones.

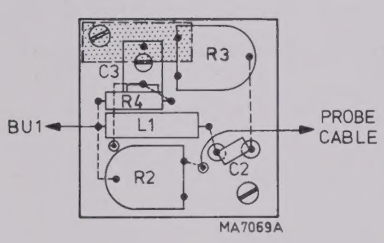
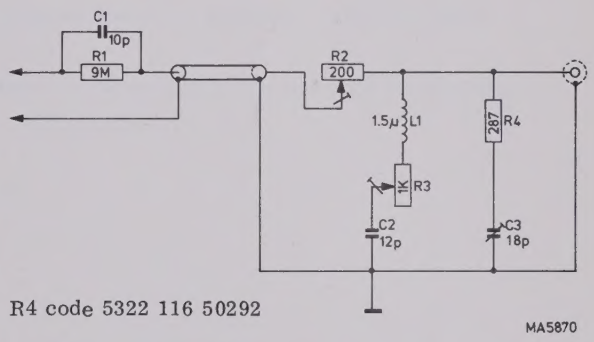


Fig. 3.3.1. Wiring diagram of the printed wiring board



R4 code 5322 116 50292

Fig. 3.5.1. Circuit diagram

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TEST AND MEASURING INSTRUMENTS

To avoid complaints on broken compensation boxes we decided to rebuild our stock of probes PM 9350/01 by attaching compensation boxes of a sturdier design.
The rebuilt probes are equal to the /02 version, however they have kept their original circuit arrangement.
Below you will find the pictures that replace the corresponding ones of the PM 9350/02 manual.
An erratum sheet will be inserted in the relevant -/02 manuals.

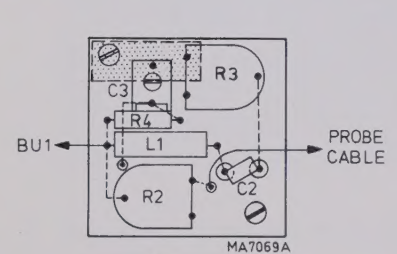
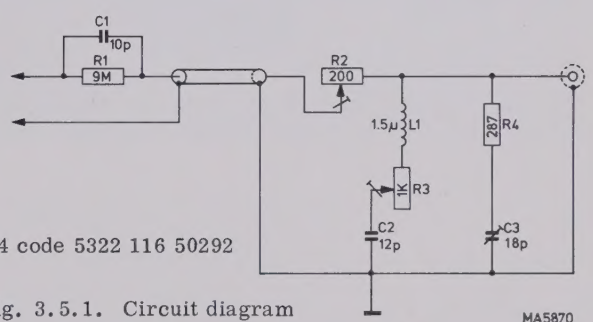


Fig. 3.3.1. Printed wiring board



R4 code 5322 116 50292

Fig. 3.5.1. Circuit diagram

III. SERVICE DATA

3.1 DISMANTLING

3.1.1. Dismantling the probe

The forward part (12) of the measuring probe can be screwed from the rear part (15). (12) and (13) can then be slid from (14) and (15).
The RC combination (14) is soldered to (15).
For replacement of (14) refer to section 3.2.

3.1.2. Dismantling the compensation box

Unscrew the ribbed collar of the compensation box to the cable (13) and slide it back over the cable. The casing (19) can then also be slid back over the cable. The electrical components on the printed wiring board are now accessible at both sides.

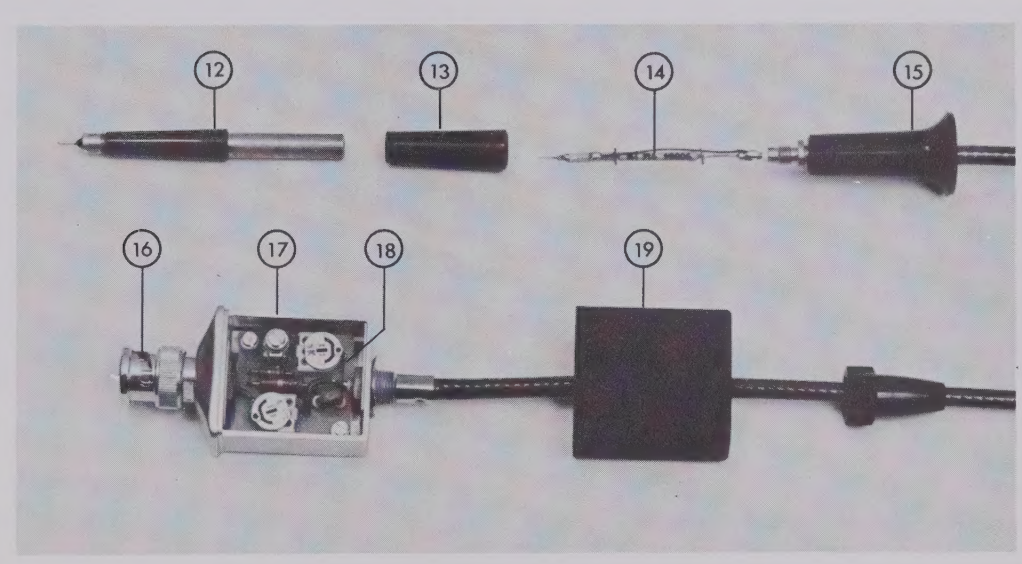


Fig. 3.1.1. Assembly of the probe PM 9350

3.4 LIST OF MECHANICAL PARTS

Item	Description	Ordering code
2	Measuring terminal	5322 255 44026
3	Test hook	5322 264 20024
4	Test hook sleeve	5322 264 20028
5	Protective cap	5322 532 60535
6	Probe holder	5322 256 94034
-	Probe packing with foam insert	5322 600 34003
7	BNC-measuring pin adaptor plug	5322 263 50022
8	Mini-connector	5322 267 10043
9	Earthing attachment	5322 264 20023
10	Insulating cap	5322 462 70726
11	Earthing cord	5322 321 20223
12	Probe tip	5322 264 20025
13	Sleeve	5322 532 70126
14	RC-assy	5322 219 80181
15	Cable assy	5322 320 14004
16	BNC-connector	5322 264 10025
17	Frame	5322 447 64001
18	Print unit complete	5322 216 54053
19	Casing	5322 477 64002

3.5 LIST OF ELECTRICAL PARTS

Item	Description			Ordering code
C2	Ceramic 500 V (plate)	5 %	12 pF	5322 122 34007
C3	Trimmer		18 pF	5322 125 50051
L1	Coil		1.5 μH	5322 158 10343
R2	Potentiometer 0.5 W		200 Ω	5322 100 10145
R3	Potentiometer 0.5 W		1 kΩ	5322 100 10037
R4	Metalfilm resistor 0.25 W	1 %	53.6 Ω	5322 116 50922

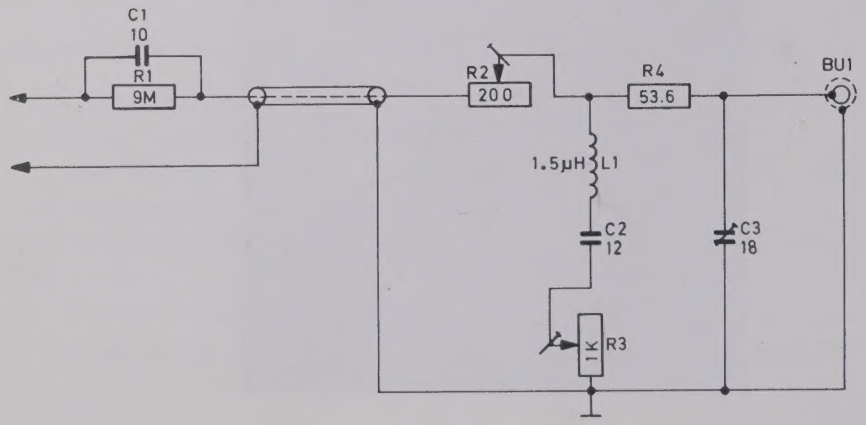


Fig. 3.5.1. Circuit diagram of the PM 9350/02